Synopsis for the Thesis

Entitled

"Impact of Extensive Use of Synthetic Fertilizers For Cash Crops on Soil Health of Irrigational Land Area In Nanded District, Maharashtra and It's Cost-Benefit Analysis"

To be submitted to

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By

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March, 2022

PROBLEMS

Fertilizers are manmade (Synthetic) and have various side effects. Less production and high expense is carried out. Study is based on the cost-benefit and effect of fertilizers on soil in study area and relationship between cash crops and economical conditions.

INTRODUCTION

Fertilizers are substances used to add nutrients to the soil to promote soil fertility and increase plant growth. Today fertilizer has become essential to modern agriculture to feed the growing population. Use of fertilizers, especially, the chemical fertilizers has brought in blessings on humanity, which helped contain hunger and death in different corners of the world. Though chemical fertilizers increase crop production; their overuse has hardened the soil, decreased fertility, strengthened pesticides, polluted air and water, and released greenhouse gases, thereby bringing hazards to human health and environment as well. Scientists and researchers are seen arguing in favors of organic fertilizers as the best solution to avoid soil pollution and many other threats to environment and life caused by overuse of chemical fertilizers.

Continuous use of these chemical fertilizers depletes essential soil nutrients and minerals that are naturally found in fertile soil. Because soils have strong buffering power due to their components. Over the time, there is deterioration of soil fertility, soil degradation reactions occurring in the soil leads to deterioration of the balance of the current elements. Even then most of the of farmers using wide variety of synthetic fertilizers to get more yield and eventually damaging the soil health in the irrigated region of the districts, certainly they are getting more yield but compromising with the health of soil, continuous use of fertilizers particularly in irrigated areas where taking repeated crops may further deteriorate the quality of soil.

The prime aim of the study is to explain the impact of using synthetic fertilizer in soil and also the importance of soil for future. And how the over use of fertilizers is deteriorating the quality of soil and polluting the water nearby area and gives suitable and scientific solutions to the farmers.

This research work will specially focus on the frequency of fertilizers used in study area i.e., N P K on soil. Assessing scientific way and using standard methods to analyze the pH of soil, soil organic carbon (SOC), total nitrogen (TN), available phosphorus, C/N ratio, and available nutrients etc.

SURVEY OR REVIEW OF LETTERATURE AND DEVELOPMENT IN THE RELEVANT SUBJECT

- The principle role of organic fertilizer on soil property and agriculture productivity -A Review (Sisay Assefa 2019)

- It is that an excessive intake of nitrate ion has some bad effects on people's health. To investigate effects of nitrate ion on human bodies. We conducted series of experiments on how to reduce nitrate ion contained in spinach through specific fertilizer application approaches as well as diminished use of fertilizers (Asano *Y. M. Kato and K Sodegaki 2005)*

- Helsnikovsky Lukas et al (2015):. "Effect of fertilizer application soil type and year on yield and technological parameter of winter wheat (triticum aestivum) in The Czech republic.

- Archieve of agronomy and soil science 61.1(2015): 33-53. The effect of fertilizers, sulpher and muluch on east African tea soils 2nd the of base status and organic matter content of soil.

- (Tapan Adhikari and Sivakoti Ramana (2019): Recent developments on application of nanotechnology in agriculture, plant mineral nutrition, soil health, and interactions it soil micro-flora Directed to sustainable solutions by replacing traditional bulk fertilizers with their nano-particulate counterparts possessing superior properties to overcome the current challenges of bioavailability and uptake of minerals, increasing crop yield, reducing fertilizer wastage, and protecting the environment Chemical fertilizers are of various types in the form of nitrogenous phosphate potassium fertilizers. The employment of fertilizer not only increase crop productivity but also alters soil physiochemical and biological properties.

SOIL QUALITY ASSESSMENT

Assessing soil quality is difficult not because of air and water quality, but because of its geographical and soil characteristics. To overcome this problem, Larson and Pierce proposed five properties of soil quality, in which the physical, chemical and biological properties of the soil give it three functions.

Soil function:

1) Creates the soil in which plants grow,
2) Regulates and distributes water flow in the environment, and
3) Acts as an environmental filter. They also showed that soil quality determines how efficient the soil is:
4) Receiving, storing and separating nutrients and other chemicals; (II) taking, retaining and separating water from plants, streams and groundwater; Promotes and maintains root growth.
5) Proper protection of the biological environment in the soil.

6) Responds to control and resists deterioration. Karlen and Stott suggested comparing soil quality with soil processes and properties that are sensitive to soil and grain management practices.

They identified four important functions:

(1) Adapting water to the soil.

(2) Facilitating water transportation and absorption.

(3) Enhancing soil erosion resistance.

(4) Promoting plant growth.

STUDY AREA

Nanded district agriculture locations are selected for the current research. The Nanded [Ardhapur, Barad (Mudkhed), Lahan Lon.

Nanded district has a geographical area of 10,528 square meters. Km, which accounts for 3.41% of the total geographical area of state of Maharashtra. The district is located on the Deccan Plateau. The town of Nanded is located between latitude 19 ° 05 'N and longitude 77 ° 02' E. The urban area of Nanded is 51.67 km. Dhanegaon is one of the growing industrial zones.

The district is predominately an agrarian district. The total geographical area of the district is 10,528 Sq Km. Agriculture is the main sector in the economy of the district. This is mainly dependent on monsoon rainfall. The district has three major irrigation projects. They are (I) Purna Project - covering an area of 20,000 hectares, (II) Manor Project - covering an area of 23,310 hectares, and (III) Vishnupuri Project - covering an area of 28,340 hectares.

Hingoli is located in the northern part of Marathwada in Maharashtra. The boundaries of Hingoli are surrounded by Washim and Yavatmal on the north side, Parbhani on the west side, and Nanded on the southeast side. The district was formed on May 1, 1999 by dividing Parbhani district. Latitude Of Hingoli District is 19.43 N and Longitude is 77.11 E.

GOALS AND OBJECTIVES

The following aims and objectives are to be considered for further research and investigation for the next upcoming years in details.

- To check the soil status of study area at the selected agriculture sites.
- To find the solutions of scientific use of irrigation and applications of fertilizers for sustenance of soil quality.
- To study the impacts of fertilizers (NPK,) on soil pH, soil organic carbon (SOC), total nitrogen (TN), available phosphorus, C/N ratio, and available nutrients, which are important characteristics of soil
- To study the mechanisms of nitrogenous fertilizer action on soil acidification through a research period and experiments.
- To identify the average C/N ratio decreased with the number of years of fertilization, and reached lowest in NPK in selected areas of Nanded.
- To determine and respond to natural and man-made pollution.
- To suggest the concrete solutions on restoration of soil fertility.

RESEARCH METHODOLOGY

The aim of this study is to determine the influence of a soil quality in agriculture on the analysis of various physical and chemical parameters of the soil. The stream from the cash crops uses fresh water and excessive use of fertilizers, resulting in deteriorating soil quality. People use this surface water and groundwater for agricultural purposes. The agricultural sector plays an important role in strengthening the economic and social development of the country. The increasing the load of fertilizers leads to land degradation and loss of valuable agriculture land permanently. This will be making additional load on natural resources like water and land.

Soil samples collected from the farm covered the entire area and surroundings. Different methods are used to analyze the different physical and chemical parameters of the soil were analyzed by different method, pH will be determined by Electrometric method instrument used will be pH meter, Electrical conductivity shall be determined by E.C meter, Soil organic carbon will be analyzed by Walkley-Black chromic acid wet oxidation method, Potassium will be analyzed by Flame Photometer, Phosphorus and Sulphur will be analyzed by Spectrophotometer.

IMPORTANCE OF STUDY

INTERNATIONAL STATUS:

- Helps to find out problems as per the Australian Bureau of statics the amount of waste material filled in land from 2001 to 2007 its increased by twelve percent. Now can you imagine in 2022. Its show that the how much soil health destroyed.
- Recent evidence suggests that the main obstacle to sustainable agriculture development is the failure of any economic policy.

NATIONAL STATUS:

Effect of fertilizers in Punjab according to government 0.005 lakhs sq per tones in 1960-61. And now it's increased to 20 LMT in 2019-20 in Rabi season. So we think that how much synthetic fertilizers are using in agriculture field. So we get idea about soil irruption and its side effect on health.

REGIONAL STATUS:

- According to ministry of agriculture and farmers welfare for various states reveled that almost 42 percent samples collected from Maharashtra. Deficient in nitrogen, 21 percent low in phosphorous and 4 percent poor potassium levels- Times of India, Nov.27, 2019.
- Here major significance is that we could understand the side effect of synthetic fertilizers. From this example we required the sustainable solutions.

SCOPE OF STUDY:

Soil test based on fertility management might be one of an approach for sustainable agricultural production systems. The first and foremost benefits of a soil testing provide how much nutrients present in the soil and we must understand requirement of nutrient to soil.

PROPOSED WORK PLAN WITH A TENTATIVE CHAPTER SCHEME.

- Introduction
- Review of literature
- Material
- Discussion
- Summery/ conclusion
- References/bibliography

YEAR WISE WORK PLAN AND TARGET TO BE ACHIEVED

First year

- Search and collection of literature.
- Collection and analysis of soil samples from selected spots in first year seasons.
- Collection and analysis of soil samples from selected spots in second year season

Second year

- Evaluation of effect of selected on soil and cash crops.
- Data collection and its analysis.
- Compilation and interpretation of the collected data.
- To suggest hazards of fertilizers.

Third year

Preparation of research report, papers and articles.

Preparation of thesis.

EXPECTED OUTCOMES

If the result would be used positive the farmer should get idea to work.

We could be analyzed the cost benefits ratio.

Nanded region of soil would understand the nature of fertilizers.

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Place: Nanded. Date: March, 2022